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EXPLANATION OF PLATE XLVI.—Figs. 1, 2, 3, 4. Haustoria on hazel-root about $\times 8$, (see text). Fig. 5. Longitudinal section of haustorium and hazel-root of the same form and arrangement as those of Fig. 3. *e*, epidermis; *ep*, epidermoidal layer; *bk*, bark (parenchyma and sclerenchyma cells); *cm*, cambium; *pt*, central wood cylinder of *Gerardia*-root cut across; *ac*, meristematic tissue; *b*, epidermis and bark of hazel-root; *c*, cambium; *w*, wood tissue; *G*, portion of the haustorial apex that has worked its way around the wood-cylinder of the foster-root to its lower side (*cf.* Fig. 3); *D*, large pitted duct of *Corylus* with entering vessels of *Gerardia*; $\times 45$.—Fig. 6. Cross-section of both *Corylus* and *Gerardia*-roots. As the tissues of the haustorium appear in the same way as in Fig. 5, the outlines only are given. *en*, endodermis; *c*, *b*, *w*, same as in Fig. 5, $\times 25$.—Fig. 7. Longitudinal section of both *Corylus* and *Gerardia*-roots. Letters as in Fig. 5, $\times 45$.—Fig. 8. Section of a haustorium occupying the end of a rootlet, as illustrated in Fig. 2, $\times 45$.—Fig. 9. The duct *D*, Fig. 5, magnified $\times 460$. 1, large vessel of *Gerardia* cut across, showing perforated septum; 2, 3, 4, 5, smaller vessels communicating with 1 and opening into the large *Corylus*-duct; the vessel 4 shows remnants of its absorbed end wall and (below the rim) of a septum, also the scalariform thickening of its farther wall.—Figs. 10 and 11. Wood-cells of an unknown root attacked and entered by some haustorium cells of *Gerardia flava*, $\times 500$.—Fig. 12. Tangential section of hazel-root with medullary ray cut across, and with large duct *d*; *v*, cells of haustorium, $\times 135$.—Fig. 13. Duct *d*, of Fig. 12, magnified $\times 460$, to show the vessels of *Gerardia*, *v*, opening into the duct, and the cells 1 and 2 disintegrating its end wall.

All the powers given above refer to the original drawings, which, in the plate, appear reduced to one-half their size.

Kansas Fungi.*

By J. B. ELLIS and W. A. KELLERMAN.

ÆCIDIUM ÆSCULI.—Hypophyllous, on pale yellowish, slightly thickened spots, 4–6^{mm} in diameter. *Æcidia* orange-yellow, 30–75 on each spot, generally with a vacant space in the centre, hemispheric and closed at first, about 200 μ in diameter, at length opening above and becoming short cylindric, with an irregularly lacerated margin; spores orange-colored, irregularly globose (19–25 μ) with coarse granular contents; the component cells of the *æcidia* subhexagonal or oblong, and faintly striate, the striae extending more or less perfectly entirely across.

On leaves of *Æsculus glabra*. May. No. 526.

ÆCIDIUM VERBENICOLA.—*Æcidia* hypophyllous, clustered, 3–35 together, 200–250 μ in diameter, orange-red within, covered outside with a granular, semitransparent coat like grains of sugar; margin of *æcidia* white, recurved and sublacerate-dentate; component cells subhexagonal (19–25 μ), or elongated (30–35 \times 20–25 μ), surface marked with flexuous ridges and tubercles; spores globose, elongated or subangular by compression, 19–25 μ , orange. The corresponding spots on the upper surface of the leaves are at first pale yellow but become purplish black.

On leaves of *Verbena urticifolia* (No. 532) and *V. stricta* (No. 549.) June. Possibly not distinct from *Æc. Verbenæ*, Speg., but differs with constantly clustered *æcidia* with *recurved* margin, and in not being hemispheric at first.

ÆCIDIUM CEAONOTHI.—*Æcidia* hemispheric, closed at first, but

*The species here described were collected by Dr. W. A. Kellerman in the vicinity of Manhattan, Kansas, from May to September, 1884.

finally open, with an erect, subentire margin, .33-.5^{mm.} in diameter, whitening out; component cells with a more or less distinct striate margin; spores subglobose, about 20 μ in diameter, orange. The portion of the leaf occupied by the fungus, generally a small marginal area .75-.5^{cm.} in diameter, is slightly thickened.

PHYLLOSTICTA CORNUTI.—Perithecia minute (70 μ), black, thickly scattered on indistinct brownish spots (2-3^{mm.}) nearly round or limited by the veinlets of the leaf, subangular and of irregular outline and more or less confluent; spores oblong-cylindric, about 3x1 μ .

On withered or dead leaves of *Asclepias Cornuti*. Aug. No. 620.

PHYLLOSTICTA VERBASCICOLA.—On large, brown, rather indefinitely limited spots, 1.5-1^{cm.} across, or, by confluence, 2-4^{cm.}, occupying large irregular areas of the leaf. Perithecia buried in the substance of the leaf, 100-150 μ in diameter and filled with abundant subhyaline or brownish tinted, oblong-elliptical spores, mostly 3.5-4x1.5-2 μ , with a few darker and larger.

On leaves of *Verbascum Thapsus*. July. No. 587.

P. Verbasci, Sacc., is on small bleached spots and has spores 6x3 μ , slightly constricted in the middle.

SEPTORIA LEPTOSTACHYAE.—Perithecia amphigenous, punctiform minute, black, scattered on pale brown spots 2-4^{mm.} in diameter, limited in part by the veinlets of the leaf, and without any very distinct raised border; spores filiform, slightly undulate-curved (nucleate?) 20-22 μ by about 1 μ , or rather less.

On leaves of *Phryma Leptostachya*. Ohio. June, 1883. No. 344.

SEPTORIA CEPHALANTHI.—On round, red-brown spots (1.5-3^{mm.}) with a narrow, slightly raised border. Perithecia minute (130-120 μ) mostly collected in a cluster in the centre of the spots; spores abundant, fusiform, brownish, continuous, nearly straight, 12-20x1 μ . This can hardly be *S. verruciformis*, B. & C., which is on branches of *Cephalanthus*.

On leaves of *C. occidentalis*. Aug. No. 602.

SEPTORIA STENOSIPHONIS.—Spots red-brown 1-2^{mm.}; or, by confluence, 2-4^{mm.} across, either remaining brown or whitening out in the centre, the whitened part being surrounded by an indistinct narrow border, which is included in the limits of the brown spot; perithecia visible on both sides of the leaf, mostly collected in the centre of the spots, brownish black, subglobose (90 μ); spores filiform, yellowish or nearly hyaline, but slightly curved, 18-30x1 μ .

On *Stenosiphon virgatus*. July. No. 578.

Closely allied to *S. Enotherae*, West., but spots smaller, spores shorter and narrower and perithecia less numerous.

ISARIA XYLARIOIDES.—Stems fasciculate, about 1^{cm.} high and 1^{mm.} thick, brown, dusted with yellow powder below and bearing above a white, oblong head, composed of loosely branching hyphæ bearing abundant globose or ovate hyaline conidia, 2-2.5^{mm.} in diameter. The whole somewhat resembles an imperfectly developed *Xylaria*, which perhaps it is.

On dead wood. June. No. 554. Sent also from Bethlehem, Pa., August, 1884, by Mr. E. A. Rau.

CERCOSPORA ISANTHI.—On round (1^{mm.}) white spots, with a nar-

row raised border, hyphæ tufted ($25-30 \times 4\mu$), crooked and subdeterminate above, continuous, brown; conidia clavate-cylindric, multisepitate, $75-100 \times 3-4\mu$. The spots are at first purplish, with a purple shaded border but soon whiten out.

On leaves of *Iisanthus*. Manhattan, Ks. Aug. No. 610.

CERCOSPORA TUBEROSA.—Hypophyllous, on spots ($.75-5^{\text{cm.}}$) at first gray and imperfectly defined, but at length dirty brown and of irregular outline, angular, elongated and partly limited by the veinlets of the leaf, hyphæ arising from a small tubercular base, nearly straight and more or less toothed above, septate, brown, $35-45 \times 4\mu$; conidia subcylindric, slightly tapering downwards, subfuscous, 5-10-septate, $80-110 \times 3.5-4\mu$.

The spots are darker and more distinctly defined on the upper side of the leaf. This differs from the preceding chiefly in the character of the spots.

On leaves of *Apios tuberosa*. No. 613.

CERCOSPORA OCULATA.—Mostly epiphyllous, on dirty brown spots ($.25-75^{\text{cm.}}$), with a definite, slightly raised, narrow, darker border; hyphæ cæspitose, short ($25-30 \times 4\mu$) obtuse, simple, brown, continuous, entire or slightly denticulate and obtuse above; conidia at first oblong and 1-septate, $20-30\mu$ long, at length attenuated below and becoming $30-60 \times 3-4\mu$ and faintly 3-septate.

The spots are often concentrically wrinkled and sometimes confluent, forming patches $2-3^{\text{cm.}}$ across. This differs from *C. Vernoniae*, E. & K., in the different character of the spots, as well as in its shorter and less distinctly septate conidia.

On leaves of *Vernonia Baldwinia*. July. No. 574.

CEROCOSPORA TEUCRII.—Epiphyllous, on brown (mostly $1-2^{\text{mm.}}$) spots which soon become dirty white, with dark or purple shaded border; hyphæ tufted, brown, crooked and sub-denticulate above, $75-120 \times 3-4\mu$, faintly septate.

On leaves of *Teucrium Canadense*. Aug. No. 457.

Notes on *Corema Conradii*.

In July, 1879 I found *Corema Conradii* growing quite abundantly at Grand Lake, Nova Scotia. It was limited, however, to a bare promontory on the eastern shore of the lake, and was associated with *Myrica Gale*.

ELIZABETH G. KNIGHT.

— To Mr. Redfield's interesting and comprehensive list of localities of *Corema Conradii*, in the last number of the BULLETIN, I have one addition to make. On the summit of Blue Mountain, just back of Camden, Maine, perhaps eight hundred feet in height, and within a half hour's climb from the village, I have found several large patches of this interesting species. The dates of flowering are noted in my herbarium as May 18th, 1859, and May 2nd, 1860.

Washington, D. C.

J. W. CHICKERING.

— Prof. Fowler, of Kingston, Ontario, has found *Corema Conradii* abundant in a sphagnous bog near St. John, New Brunswick. I have seen it also at Aylesford, Nova Scotia, growing on a sandy plain